FIELD PERFORMANCE OF DESMETRYNE FOR WEED CONTROL IN CHOUMOELLIER

D. D. McPHAIL

Geigy New Zealand Ltd., Wanganui

Summary

The field performance of desmetryne for weed control in choumoellier is reviewed under the headings of crop tolerance, weed control and crop yield. Four ounces active ingredient applied to crops at the 4- to 6-leaf stage was well tolerated by the choumoellier by visual assessment and gave acceptable weed control of the main weed species, especially fathen (*Chenopodium album*). Yield assessment from one unreplicated trial is given and shows the increase obtained following treatment of a weedy crop.

INTRODUCTION

DURING the period from 1963 to 1965, desmetryne was tested under a variety of New Zealand conditions for weed control in brassicas. This work showed that, while swedes and turnips were insufficiently tolerant of the herbicide, choumoellier at the 4-leaf stage could be treated safely with 4 oz (rates given as active ingredient per acre), which rate gave satisfactory control of the more important weed species.

Accordingly a 25% wettable powder formulation of desmetryne was provisionally registered for use in choumoellier for the 1965-6 season. Recommended application rate was 4 oz in 20 to 40 gal of water when the crop was at the 4- to 6-leaf stage. A rate of 6 oz was suggested where a salvage operation was necessary on a more advanced crop.

Approximately 800 to 1,000 acres were treated, the great majority being summer-sown crops.

In order to evaluate the performance of the material under these varied field conditions, results were assessed on 41 crops through the Rangitikei, Manawatu, southern Hawke's Bay, Canterbury, Otago and Southland areas. Seven crops were treated with 6 oz, the remainder with 4 oz.

The results of this survey are discussed in terms of crop tolerance, weed control and crop yield.

CROP TOLERANCE

The factors affecting the susceptibility and recovery of choumoellier are plant size at time of treatment, application rate of herbicide and existing and subsequent growth conditions. The survey confirmed the following points relative to these factors.

1. GROWTH STAGE AT TIME OF TREATMENT

The 4- to 6-true-leaf stage is the earliest at which choumoellier will tolerate the recommended rate of desmetryne. In some crops inspected, plants smaller than this were completely unaffected but

this must be regarded as unusual and possibly the result of uneven application and exceptional growing conditions. Application before the 4-leaf stage must be regarded as hazardous. In four cases out of 41, crop damage was considered unacceptable. In two of these the fault was failure to recognize the correct growth stage, the cotyledons being included wrongly as true leaves. The other two crops affected showed uneven, prolonged germination and were treated when the first plants had four leaves whereas treatment should have been delayed until the majority of the crop plants had reached that stage.

2. APPLICATION RATE

The normally recommended rate of 4 oz will be sufficiently tolerated if application is made at the recommended 4 to 6-leaf stage and growth conditions are favourable. Where the crop is beyond this stage and weeds correspondingly larger, 6 oz can be applied to improve control of these more resistant weeds without significant crop suppression.

3. GROWTH CONDITIONS

Choumoellier plants showing damage from desmetryne recover well provided conditions of temperature and soil moisture are favourable. In all the cases reviewed, some rain fell within 14 days before or after treatment, so no crop suffered from drought. In those crops where smaller plants were damaged, recovery was generally outstanding. However, it is reasonable to conclude that, if prolonged hot dry weather had followed application, recovery of these small plants would have been less satisfactory.

WEED CONTROL

Table 1 gives a summary of specific weed control observed in treated crops throughout the survey. Fathen was undoubtedly the major weed, followed by redshank, red root, nightshade and spur-rey.

Specific notes on the five major weeds are as follows:

FATHEN

Control was always outstanding. Plants up to 12 in. in height were always killed by the 4 oz rate and larger plants severely damaged and so suppressed as to allow the crop to smother them. The 6 oz rate killed plants up to 18 in. high.

RED ROOT AND REDSHANK

Not as susceptible as fathen and results were more variable. Plants up to 6 in. high were always killed with the 4 oz rate and even up to 18 in. high were satisfactorily suppressed. 6 oz was sufficient to suppress plants up to 24 in. high.

NIGHTSHADE

This weed was less susceptible again. Satisfactory control was achieved where plants did not exceed 6 to 8 in. Plants up to 12 in. high were checked.

TABLE 1: WEED CONTROL IN TREATED CROPS

Weed Species	Stage (in.)	Desmetryne 4 oz	Rate 6 oz
<i>Chenopodium album</i> (Fathen)	0-12	+++	+++
	12-16	++	+++
	>16	+(+)	++(+)
<i>Polygonum persicaria</i> (Redshank)	0-6	+++	+++
	6-12	+(+)	++(+)
<i>Amaranthus hybridus</i> (Red root)	0-6	++(+)	+++
	6-12	++	+++
	12-24	+(+)	
	24 seeding		+(+)
<i>Solanum nigrum</i> (Nightshade)	0-6	++	++(+)
	6-12	+(+)	+(+)
<i>Spergula arvensis</i> (Spurrey)	All stages to flowering	+(+)	++(+)
<i>Capsella bursa-pastoris</i> (Shepherd's purse)	0-6	+(+)	+(+)
	>6	+	+
<i>Agropyron repens</i> (Old-man couch)	3-4	+(+)	++(+)
<i>Rumex acetosella</i> (Sorrel)	1-3	++	++
<i>Brassica campestris</i> (Wild turnip)	2-3	++	++(+)

+++ Excellent control
 ++(+) Very Good
 ++ Satisfactory
 +(+) Growth Suppression
 + No effect

SPURREY.

Results from the 4 oz rate were extremely variable, probably because of the difficulty of obtaining complete coverage. If crop vigour is good, the suppression obtained is sufficient.

Californian thistle (*Cirsium arvense*), docks (*Rumex* spp.), penny cress (*Thlaspi arvensis*), wild pansy (*Viola arvensis*), sow thistle (*Sonchus oleraceus*), cornbind (*Polygonum convolvulus*), storksbill (*Erodium cicutarium*) and plantains (*Plantago* spp.) showed some initial scorching but no lasting effects and there was probably little suppression.

Under the conditions which prevailed in this season, overall weed control can be regarded as highly satisfactory. The main weeds found in choumoellier were controlled and other species suppressed.

CROP YIELD

Desmetryne was applied at 4 oz to three-quarters of a paddock, the middle of the paddock being left untreated. The crop was at the 4-leaf stage and the main weeds present were fathen and nightshade. The results are given in Table 2.

These results confirm that even such a robust crop plant as choumoellier under favourable growing conditions will suffer

TABLE 2: RESULTS OF CROP YIELD TRIAL
(Yields in green weight — tons per acre)

					<i>Leaf Weight</i>	<i>Stem Weight</i>	<i>Total Yield</i>
Untreated	.....	.....	.....	.....	12.6	16.1	28.7
Treated	.....	.....	.....	.....	14.8	24.75	39.5
Treated as percentage of untreated	.....	.....	.....	.....	117.3	153.6	137.7

significantly when competing with taller growing weed species such as fathen and nightshade. They also show that the advantage obtained from effectively reducing weed competition substantially outweighed any check from the slight herbicide effect on the crop.

CONCLUSIONS

Under generally favourable growing conditions, desmetryne, in its first season of farm-scale use, has proved to be an effective, safe and economical material for weed control in choumoellier. As Table 1 shows, desmetryne is sufficiently active to control the major weeds at a comparatively advanced stage. While it is essential that treatment be delayed until the crop has reached the 4- to 6-leaf stage, there is still a longer period during which application can be made and acceptable weed control achieved.

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